

Thesis Project Portfolio

Developing Design Features to Facilitate AI-Assisted User Interactions

(Technical Report)

Utilizing Actor-Network Theory (ANT) in the Analysis of the TikTok Ban Within the Privacy Landscape

(STS Research Paper)

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Sociotechnical Synthesis

Companies generate mass amounts of data every day capturing valuable business information such as consumer behavior, system performance, and security intel. To manage the sheer volume of incoming data, organizations invest in business intelligence and data monitoring software. These platforms provide functionalities to source, aggregate, and visualize data revealing insights necessary to make informed strategic decisions and mitigate risk. However, the adoption of these analytics tools is challenging for analysts, who often encounter barriers like navigating complex user interfaces and learning native querying languages. To bridge the user's gaps in system knowledge, some platforms integrate Artificial Intelligence (AI) assistants that take in a user's prompt describing a task in natural language and perform it for the user. The AI, however, is typically an isolated feature, lacking contextual awareness of the analyst's specific use case.

The technical project described provides an interaction design for a data analytics platform that integrates AI assistance within the data searching/ querying process; the design aims to craft a more collaborative experience with AI and help analysts achieve a goal-oriented analysis process. The key features of the design include 1) search category refinement patterns 2) customization of query input format by the user's technical ability, and 3) context-aware prompt recommendations. The first feature addresses the difficulty for AI to identify a relevant data subset for targeted analysis by providing a design pattern for the analyst to select an appropriate subset themselves while simultaneously obtaining dedicated AI assistance. A total of four patterns were created, each varied in level of manual effort from the user versus AI-driven suggestion in category selection. The second feature allows analysts to write queries in three varying levels of technical maturity: natural language, block-based visual programming, and pure code. The final key feature occurs after the query has been entered, to which the AI will detect the analyst's search goals and suggest alternative prompts the analyst can explore for deeper searches. Mockups of the designs were made in Figma and refined iteratively.

Usability evaluations were conducted for the proposed design concepts using 6-8 actual users of varying levels of professional experience with data analytics software. Testers were evaluated in the aforementioned areas of our design. To assess search comparison, testers interacted with the four interfaces we created to assess which best suits a user's needs. Testers completed a time-based trial and performed exploratory testing to measure differences in efficiency. Input maturity was measured by testers creating and debugging pre-defined queries, enabling testers to interact with all three input levels. The time taken to complete a prompt was compared between groups separated by level of coding experience. In testing prompt suggestions, the user interacted with a set of 4 different prompt recommendation layouts to evaluate presentation formation.

Meanwhile, the STS project utilizes actor network theory to analyze the relations of the role of privacy with the TikTok ban conflict. The different elements of interaction were organized into both human and non-human actors. In this case, the human actors would consist of the government and regulatory bodies that have their own interests and agendas regarding privacy in ensuring compliance with laws and protection of the privacy of citizens. Meanwhile, TikTok's parent company, ByteDance serves as the central non-human actor since it has the capability to collect, process, and analyze large amounts of data. This, in turn, influences and shapes the way that privacy is observed and practiced. Some other non-human actors could also take the form of the privacy concerns and privacy regulation that form as a result of them. These actors influence government and regulatory bodies by setting the boundaries for data sharing and

also influence behavior between the human actors. In terms of the network, there are many ways that the actors shape and influence each other. Due to the different types of agendas and interests, there will be a constant interplay between them in the form of negotiations and evolving dynamics. Thus, actor-network theory was a great tool to evaluate and conduct my research, as well as develop the relationships between the relevant social groups, or actors. Analyzing this landscape by segmenting the users by scale including the individual, firm, and nation aided in building a comprehensive dynamic further compounded by the breakdown of individual actors. After all, the precedent set by this decision could change the privacy landscape on all scales for several years to come.